Abstract

BACKGROUND: Adequate passive stiffness of the hip joint can prevent the occurrence of excessive transverse plane lower limb movement during functional activities. Strength training of the hip lateral rotator muscles can be used to increase the stiffness of this joint. However, the relationship between hip joint passive stiffness and muscle strength remains undocumented in the literature. OBJECTIVE: To investigate the association between hip passive stiffness measured during medial rotation and hip lateral rotator concentric torque in healthy young adults. METHOD: Twenty-six individuals with mean age of 24.42±2.77 years participated in the present study. To quantify hip stiffness, the passive resistance torque during medial rotation was measured using an isokinetic dynamometer. Stiffness was determined by the mean slope of the passive torque curve obtained in the first 20° of motion. Electromyography was used to ensure inactivity of the hip muscles during this procedure. The isokinetic dynamometer was also used for assessment of hip lateral rotator peak torque and work in a range of motion of 55° of rotation. RESULTS: Linear regressions demonstrated correlation coefficients of r=0.70 (R²=0.50/p<0.001) and r=0.77 (R²=0.59/p<0.001) between hip passive stiffness and the measures of lateral rotator peak torque and work, respectively. Conclusions: There is a moderate to good association between hip passive stiffness and lateral rotator concentric torque. This association suggests that lateral rotator strength training can increase hip stiffness.

Keywords

Passive stiffness, muscle strength, hip, muscle strength dynamometer, rehabilitation.